Space Weather Forecast

Issued on Wednesday, 07 September 2022 at 12:42 Local

This forecast provides a four day assessment of space weather events. The probabilities stated below are for reaching or exceeding the given levels. For more information about space weather impacts please see the Met Office Space Weather Scales https://www.metoffice.gov.uk/weather/learn-about/space-weather/uk-scales

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Space Weather Forecast Headline: Chance of G1 Minor Geomagnetic Storm day 1 (7th). Slight chance of M-class flare (R1 Blackouts) day 1 (7th).

Analysis of Space Weather Activity over past 24 hours

Solar Activity: Solar activity was Low with several common class flares observed, mostly from ex-A3089. There are eight potential sunspot regions on the visible disc, four of which are numbered, and all of which are currently small and simple.

There have been no Earth directed coronal mass ejections seen in satellite imagery over the last 24 hours.

Solar Wind / Geomagnetic Activity: The solar wind was indicative of a waning coronal hole high speed stream, with speeds fluctuating in the range 530km/s to 600km/s, and on a broadly steady trend. Total interplanetary magnetic field strength was weak. The north-south component varied equally between weakly positive and negative. Geomagnetic activity was Quiet to Active (Kp 2-4).

Energetic Particles / Solar Radiation: The count rate of energetic particles (high energy protons) is at background levels, with no solar radiation storms occurring.

Four-Day Space Weather Forecast Summary

Solar Activity: Solar activity is expected to be largely Low, with a slight chance of becoming Moderate with isolated M-class flares, mostly from ex-AR3089. This spot will likely exert influence on the flare risk due to its location until the end of day 1 (7th).

Solar Wind / Geomagnetic Activity: No Earth-directed coronal mass ejections are currently expected.

Solar winds will initially be elevated due to the waning effects of the HSS from CH20/+, perhaps gradually easing to slightly elevated by the end of day 1 (7th). There is an outside chance of a HSS arriving from a faint un-numbered coronal hole, currently in the northwest quadrant through day 1 and perhaps into day 2 (7th or 8th). This may have the effect of keeping solar wind speeds elevated, though confidence on this is much lower than average. Wind speeds should then revert back to slightly elevated or background by late day 2 (8th) and for the remainder of the forecast period. Geomagnetic activity will likely be Unsettled to Active, with a chance of G1/Minor Storm intervals on day 1 (7th) and perhaps early on day 2 (8th). Baseline Geomagnetic activity should become Quiet to Unsettled (Kp 1-3) from late day 2 (8th) onward.

Energetic Particles / Solar Radiation: The count rate of energetic particles (high energy protons) is likely to remain below the Minor Radiation Storm level (S1).

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Geomagnetic Storms:

Geo-Magnetic Storm / Probability (Exceedance)	Level	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Minor or Moderate	G1 to G2	No	30	20	5	1
Strong	G3	No	1	1	1	1
Severe	G4	No	1	1	1	1
Extreme	G5	No	1	1	1	1

Radio Blackouts - X Ray Flares:

X Ray Flares / Probability	Level	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Active	R1-R2 M Class	No	15	10	10	10
Very Active	R3 to R5 X	No	2	1	1	1

Solar Radiation Storms - (High Energy Protons):

Radiation Storms / Probability (Exceedance)	Level (cm^{-2} sr^{-1} s^{-1})	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Active	≥ S1	No	1	1	1	1
Very Active	≥ S3 *	No	1	1	1	1

* S3 ≥ 10 MeV ≥ 1000 pfu and / or ≥ 50 MeV ≥ 10 pfu. (pfu = $cm^{-2}sr^{-1}s^{-1}$)

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